

NEW INVESTIGATIONS ON THE LOWER PALAEOOLITHIC PACITAN CULTURE IN JAVA

by
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Introduction

The Sewu mountains extend from the mouth of the Opak River in the north to the Pacitan Bay in the South. The area has a greatest length of 85 kilometres, a greatest width of 25 kilometre and covers approximately 1400 square kilometre. It represents a typical Cone-Karst region and is composed of an uplifted and compact massif of Upper Miocene reef-limestone overlaying disconformably folded Lower Miocene volcanic beds with shales, silicified tuff and fossil wood. The latter is exposed near the base of the Baksoka Valley, where the river cuts clear through the limestone into the old volcanic formation.

According to Lehman¹⁾, the karstification is a result tilting of the limestone, but more probably the karst which is very analogous to the karst sequences of the Northern Shan Highlands of Burma and the Yangtze Valley of South China, may be joined with a pluvial climate and came into existence as result of pluvial conditions as has been presumed by de Terra²⁾, the area remained slightly above sea-level till the Pleistocene. Then a regression of the sea took and afterwards it was elevated and tilted.

Typical for this region is the series of karstified hills (approximately 30 hills on one square kilometre), and the long and narrow valleys between them. Some are filled with water. The beehive-shaped hills are 30-75 metres high. Weathering products of the limestone as red earth (*terra rossa*) fills the karst and a younger volcanic ash deposit can be noticed in the dissected relief.

In some fissures and sinkholes which are filled up with *terra rossa* von Koenigswald has found remains of a Middle Pleistocene (Trinil Age) fauna, with bear, *tapir*, *Simia*, *Stegodon*, *Elephas namadicus*, *Echinosorex*, *Symphalangus* and *Hylobates*. This proves that the karst was developed in Middle Pleistocene times. In the lower parts of the hills many caves occur. Some trial excavations carried out by the present writer and his team yielded mesolithic and neolithic tools of stone, bone and shell associated with the remains of sub-fossil fauna including *Elephas maximus*. Therefore, the caves may have originated in Post-Glacial times.

In October 1935, Dr G.H.R. von Koenigswald³⁾ and Mr. M.W.F. Tweedie, Curator of the Raffles Museum, Singapore, paid a visit to the Sewu mountains. On the 4th of October they discovered for the first time in Java, a series of large, massive, crudely worked stone tools, apparently of a Lower Palaeolithic character. The vast majority of the tools were manufactured of volcanic rock (notably silicified tuff) and are dark in colour. Other examples were shaped

1. Joshmann, Herbert, 1936 *Morphologische Studien auf Java*.
Geogr. Abhandl. Vol. IX. Stuttgart.
2. Terra, H. de, 1943 *Pleistocene geology and Early Man in Java*.
Trans. Am. Philos. Soc. 32, p. 437-464.
3. Koenigswald,
G. H. R., von *Early Palaeolithic stone implements from Java*
Bull. Raffles Museum, 1, p. 52-60

out silicified lime stone and a few were made of fossil wood. The implements were picked up in a dry watercourse of the Baksoka River, south of Punung ; but similar tools were collected in a 'boulder conglomerate' in the bank of the river, 3-4 meters above its bed. In some place this bench was dipping under the level of the valley, showing that it was gently folded. According to von Koenigswald this proves the tectonics of the implementiferous conglomerate were not younger than the Middle Pleistocene. Yet von Koenigswald was not quite sure if these were the parent layers of all tools, some of them may be secondarily deposited and have been washed out from higher horizons.

Typologically as well geologically, von Koenigswald stated the newly discovered Palaeolithic culture represents a 'complex Chellean' with handaxes, flake tools and a few crude blades. In total approximately 3000 stone tools were collected in this very prolific locality; but thus far none of them has been extracted from a datable geologic horizon and palaeontologic evidence was almost absent.

Von Koenigswald's discovery was of paramount importance for the knowledge of the development of the oldest stone-cultures in Java and for the whole Far East as well. Great interest was aroused by the finds but it could not be ignored that detailed study of the problem was still not complete. Thus, several scientists carried on further investigations and studied this culture and its stratigraphic position, resulting in the collection of many archaeological and geological data.

In the spring of 1938, after having finished a field program in the Irrawaddy Valley of Upper Burma, which resulted in the acknowledgement of a peculiar Lower Palaeolithic cultural development in Southern and Eastern Asia, Hellmut de Terra, Père Teilhard de Chardin and Hallam L. Movius accompanied von Koenigswald to the Baksoka area to study the situation on the spot and the geologic problems connected with it.

Père Teilhard de Chardin ⁴⁾ only devoted some pages to the problem. He observed three different pleistocene formations in the area. First a thick layer of Upper Pleistocene volcanic ash in the dissected relief, secondly *terra rossa* deposits in the fissures and sinkholes of the karst where as stated before, von Koenigswald had found a fossil Middle-Pleistocene fauna and finally, three levels of terraces on respectively 2 metres (composed mainly of silt), on 10 metres (red gravel and loam with a basal layer of coarse gravel) and on 25 metres (boulder gravel with red loam). The small elevation of the lowest terrace may be explained in this way, that the river after having reached the volcanic beds, hardly any longer cuts its bed. Most tools are rolled and are heavily patinated. Without any doubt the tools are of Pleistocene age. Teilhard, also qualifies the palaeolithic assemblage as 'Chellean', in which the flake tools are little typical.

The most profound and expert study of the Pacitan tools has been made by Hallam L. Movius ⁵⁾ who very considerably enlarged our knowledge of this culture. He contests its Chellean character, rightly pointing out that true bifaces are rare, as only 153 (6.32%) out of 2419 tools can be classified as hand-axes. And even then, only 42 examples were completely

4. Teilhard de Chardin, P. 1937 Notes sur la Paleontologie humaine en Asie meridionale, *L'Anthropologie*, 47, p 23-34. Deuxièmes notes sur la Paleontologie humaine en Asie meridionale. 1938 : *Ibid*, p 449-456.
5. Movius, H. L., 1949 The Lower Palaeolithic cultures of Southern and Eastern Asia, *Trans. Am. Phil. Soc.* 38, p. 329-420.

worked around the butt-end. The working technique in most cases, notably longitudinally flaking parallel to the axis of the tool, betrays the Chopper tradition. More than 50% of the assemblage is formed by flake-implements and trimming flakes showing signs of use. The massive tools made on pebbles or on large flakes and sphere-segments derived from a shattering process, consist of Choppers, Chopping-tools, Hand-adzes and Proto-handaxes. Therefore, the Pacitanian shows a striking difference and is in marked contrast with the Lower Palaeolithic bifaces of Peninsular India, the Near East, Europe and Africa. It forms part of the great Chopper Chopping-tool Complex of the Far East which represents a continuum of an archaic pebble culture, uninfluenced by contemporary innovations and resembling such pebble cultures as the African Oldowan and Pre-Stellenbosch industries. Thusfar this complex has been recorded in Punjab ⁶⁾ where it is named the Soanian, in Burma ⁷⁾ (the Anyathian), in Siam ⁸⁾ (the Fingnoian), in Malaya ⁹⁾ (the Tampanian) and in Northern China ¹⁰⁾ (the Choukoutienian) where it was found in association with skeletal remains of *Sinanthropus* '*Pithecanthropus*' *pekinensis*.

In some instances, like in the Soanian, the Anyathian and the Choukoutienian, a Middle Pleistocene antiquity could be established and the same tradition persisted in a modified way into the Upper Pleistocene. The Anyathian, the Fingnoian and the Choukoutienian are devoid of handaxes. Several authorities when referring to the Chopper Chopping-tool complex of the Far East consider the racial factor to be essential, its authors being members of the *Pithecanthropus* group of man-kind.

A word of explanation on the use of terms as choppers, chopping-tools and so on is needed. While Movius has met with an unrecognized Lower Palaeolithic culture in the Far East, the classic sequence established in Western Europe is not applicable. It was found necessary to invent new archaeological terms for the large massive pebble tools in the following way ¹¹⁾:

„In dealing with the archaeological material from Upper Burma and Java, it was found necessary at the outset to establish two new classes of implements--*chopping-tools* and *hand-adzes*--and to redefine the terms *chopper* and *scraper*. This simply provides a convenient method of arranging the material for purposes description. Each is a purely artificial category of little or no significance from point of view of function, which, with respect to such remote period (Middle Pleistocene) is still a question of speculation. Actually, the only difference between a chopper and a scraper, both flaked by secondary working on the upper surface

6. Terra, H. de and T. T. Paterson, 1939, Studies on the Ice Age in India and associated human cultures. Carnegie Inst. of Washington, 493, p. 1-354.
7. Movius, H. L., 1943, The Stone Age of Burma, *Trans. Am. Philos. Soc.* 32, p. 341-393.
8. Heekeren, H.R. van 1948 : Prehistoric Discoveries in Siam., *Proceedings Prehistoric Society*. Cambridge, 2, p. 24-32.
9. Collings, H. D., 1938, Pleistocene sites in the Malay Peninsula., *Nature*, 142, p. 575-576.
10. Teilhard de Chardin, P. and W. C. Pei, 1932 The lithic industry of the *Sinanthropus* deposits in Chou-kou-tien., *Bull. Geol. Soc. China*, 11, p. 221-232.
11. Movius, H. L., 1949, Old-World Palaeolithic Archaeology., *Bull. Geol. Soc. of America*, 60, p. 1443-1456.
1944 : Early Man and Pleistocene stratigraphy in Southern and Eastern Asia. *Papers Peabody Mus. Am. Arch. and Ethn.*, 19, p. 1-125.

only, is one of size, and in this sense. 'large, crude scraper' are called *choppers*. The latter are usually core tools, whereas flakes predominate in the scraper category. A *chopping-tools*, on the other hand, is a core implement often made on a pebble, with a cutting edge worked from both sides. In many cases the edge itself has fashioned by alternate flaking, which produces a tool remarkable for sinuosity. *Hand-adzes* are roughly tabular chopping or cutting implements, which resemble choppers, except for the that they are square or rectangular, rather than of round or oval outline. *Choppers*, *chopping-tools*, and *hand-adzes* all differ fundamentally from the classic *hand-axe* or *coup de-poing*, which is a true bifacial tool, extensively flaked on both upper and lower surfaces. Wherever the above types of implements are found, that is in Punjab, Northern China, Upper Burma and Java, the definition given here will be adhered to for purposes of descriptions and comparison". In later papers ¹²⁾, Movius has added another type to the above-mentioned term i.e. Proto Hand-axe : „implements in most cases made on flakes, that are worked on the upper surface only, into crude and roughly pointed types of hand-adzes of plano-convex section. Cortex normally adheres to the butt-ends, and seldom is the upper surface flaked all over. These tools may be considered as transitional between hand-adzes and true hand-axes - bifaces or coup-de-poings -from a typical point of view". Movius who has examined 2419 Pacitan tools, classified the as follows :

Type of implements	Total	Percentage of total
Choppers	431	17.82
Chopping-tools	89	3.68
Hand-adzes	87	3.59
Proto Hand-axes	195	8.06
Hand-axes	153	6.32
Flake-implements	596	24.64
Trimming flakes showing signs of use	807	33.36
Cores	31	1.28
Miscellaneous	30	1.24
	<hr/> 2419	<hr/> 99.99

In this respect, attention must be drawn to Movius' following statement : "In general, no absolutely rigid line can be drawn between the above classes of implements in all cases". In the descriptions of our own finds in the Baksoka area and newly discovered Tabuhan sites, we have accepted Movius' terminology, but we have redefined the choppers into three distinct types :

- a. 'Flat-iron' choppers : Long, highbacked ; plano-convex section ; flat-iron shape ; resolved longitudinal trimming ; some examples are "keeled".
- b. 'Tortoise' choppers : Short, highbacked and flat-bottomed ; tortoise shape. There is not much difference between Movius' hand-adzes and our tortoise or turtle-backed choppers.
- c. Side-choppers : Massive side scrapers ; irregular in outline.

'Flat-iron' choppers and 'Tortoise' choppers are very characteristic for the Pacitanian ; they may be used as type-specimens or as guide-forms for this industry.

12. Movius, H.L., 1949 The Lower Palaeolithic culture of Southern and Eastern Asia. *Trans-Am. Philos. Soc.* 38, p. 329-420

Post-war investigations

After the Dutch had transferred sovereignty in 1949 to the new Republic of Indonesia, scientific fieldwork was soon possible again in Java. We have, however, restricted our record to the investigations concerning the Pacitanian,

In September 1952, a young promising palaeontologist Dr P. Marks who had just discovered an additional mandible of *Meganthropus*¹³⁾ near Sangiran in Central Java, paid a ten-day visit to the Baksoka region, making detailed geological study of the area and collecting a vast number of Pacitan tools in the river bed. Besides, he extracted some specimens from low terraces ; his paper on the subject has not been published as yet.

In the prosecution of my own study, valuable services were rendered by Mr Basuki and Mr Socjono to whom I want to express my thanks.

On the 22nd of October 1952, Mr A. Christie of the School of Oriental and African Studies, University of London, and the present writer made a brief trip to the Baksoka Valley. Stone tools were collected but the soil was so moist and swampy that it was hard to move around. On the 6th of August 1953 the same area was visited again; this time I was accompanied by P. Marks, Soejono and Basoeki. We noticed an implementiferous boulder bed on the right bank of the river and 3.20 metres above it. The tools were rolled and were found in the upper part of the bench. Similar tools were picked up in the rivergravel and from low benches (1/2 - 1 metre) of the Ngambar tributary. The next day while searching for a fossil-containing fissure near Tabuhan, Soejono discovered a well-finished 'Flat-iron' chopper near the Gedeh river. It was the first Pacitan tool ever found in this area and it led to a more careful examination of the surroundings and in the organization of more investigations. Under a rock-fall near the Gedeh river a site which was filled up by young black clay and silt (the site is overflowed when torrents come down), more Pacitan tools were found. In the riverbed, too, a number of palaeoliths was collected and on the right bank we located a small boulderbed with stone tools on top, one metre above the river. More stone tools were collected in the dry water-course of the Serikan River which connects the Gedeh River with the Sunglon River. A few implements were extracted from a low boulderbed, a half metre above streamlevel.

New investigations were planned in October 1953, but the present writer fell ill. My co-operators carried on further research during a ten-day stay. The Tabuhan area was mapped and a trial excavation was performed in the Songterus Cave, resulting in the discovery of mesolithic and neolithic tools made of stone, bone and shell and of a sub-fossil fauna including some teeth of *Elephas maximus*. Some new palaeolithic sites were discovered on the right bank of the Sunglon river ; a small cemented implementiferous boulderbed, one metre above the river and at Kiut at terrace containing Pacitan tools 5.9 meters above the river. A few palaeoliths were collected on the left bank, 20-30 meters above streamlevel at a site which may be the remnants of heavily dissected terrace.

In December 1953, we spent another ten days in the Sewu mountains, mainly making reconnoitring trips ; the soil near the rivers was very swampy in this time of the year. Nevertheless we collected quite a number of palaeolithic artifacts among them two beautiful hand-axes, one round in outline and one almond-shaped; they recall in general form as well in detail some standard form of Eurafrian Acheulean.

13. Marks, P, 1953,

Preliminary note on the discovery of a new jaw of *meganthropus* von Koeningswald in the Lower Middle Pleistocene of Sangiran, Central Java. *Indonesian Journal for Natural science*, 1-3, p. 24-33

An implementiferous boulderbed was noticed on the left bank, 1 1/2 metres above the river ; it is exactly situated opposite the mouth of the Ngambar tributary. The rolled tools were found in the upper portion of this bench.

In May 1954 Mr Basoeki made a ten-day stay at Punung ; on this occasion the Baksoka Valley was mapped over a distance of eight kilometres.

The Tabuhan area was explored again by us in June 1954 during a stay of 17 days. The trial excavation in the Songterus Cave was finished but no palaeoliths were discovered. New implementiferous terraces were located notably at Kiut, this time another red gravel terrace with palaeoliths on the right bank of the Sunglon river at an altitude of 11.5 metres above the river. At the right bank of the Serikan river a terrace containing palaeoliths was discovered 5 metres above streamlevel. In the dry watercourse of the same river we collected a well-finished hand-axe and a fine 'Flat-iron' chopper. A small excavation carried out in the one-metre bench of the Sunglon river proved that the tools were embedded in the upper portion only ; the tools were heavily waterworn. Soil examples were taken. A one-day trip to the Baksoka Valley resulted in the discovery of an implementiferous terrace at the right bank, 4 metres above streamlevel. Besides, we recognized a dissected terrace with lateric gravel, 15-20 metres above the river. It is thusfar the highest in the series. This bed has several metres of red clay on top. In total 120 unrolled stone implements were collected. They were made from silicified limestone and are entirely red stained, caused by their lying in the red clay for an indefinite period. We have tabulated the collection as follows, using Movius' classification for comparison's sake :

Type of implements	Total	Percentage of total
Choppers	25	20.8
Chopping-tools	2	1.6
Hand-adzes	1	0.8
Proto-Handaxes	8	6.7
Hand-axes	3	2.5
Flakes	81	67.5
	<hr/> 120	<hr/> 99.9

Among the choppers is one large keeled 'Flat-iron' example. The flakes are to be subdivided in 42 flake-tools and 39 trimming flakes showing signs of use.

We will now give a survey in the same way of the other sites : Baksoka river ; Rolled tools in the riverbed.

Type of implements	Total	Percentage of total
Choppers	29	20.6
Chopping-tools	5	3.5
Hand-adzes	6	4.3
Proto-Handaxes	13	9.2
Hand-axes	7	5.0
Flakes	76	53.9
Miscellaneous	5	3.5
	<hr/> 141	<hr/> 100.0

Three of the seven hand-axes are beautiful specimens. One discoidal and a large almon-shaped hand-axe are shaped out of glossy fossilized tuff. Both hand-axes are carefully

chipped on both faces; they are the finest hand-axes ever found in Java. The almond specimen has a thick butt-end and one of the long sides shows a tendency towards the 'S' twist.

TABUHAN AREA ; ROLLED TOOLS IN THE RIVERBED

	Gedeh River	Sunglon River	Serikan River
Choppers	2	4	1
Chopping-tools	3	4	1
Hand-adzes	1	0	0
Proto-Handaxes	2	1	0
Hand-axes	0	1	1
Flakes	16	9	26
	<hr/> 24	<hr/> 19	<hr/> 29

The hand-axe from the Sunglon River is a fine specimen, ovate in outline and much flatter on the lower face than the upper. The example from the Serikan River is a long, thick-butted specimen ; the butt-end is untrimmed with the crust of the pebble still adhered to it. More cortex was noticed on the posterior part of the upper face. The cutting-edges are irregular and jagged. In the same river a heavy, well-shaped 'Flat-iron' chopper was obtained. All tools in the river beds are brought down by wateraction.

	Gedeh rockfall	Serikan 5 m.terr.	Sunglon 1m.terr.	Kiut 6.9 m.t.	Kiut 11.5 m.t.	Klepu 23 m.t.
Choppers	3	0	6	4	1	2
Chopping- tools	0	0	1	5	1	1
Hand-adzes	0	0	0	0	0	0
Proto- Handaxes	2	0	3	0	0	0
Hand-axes	0	0	1	2	0	1
Flakes	17	2	22	43	1	12
	<hr/> 22	<hr/> 2	<hr/> 33	<hr/> 54	<hr/> 3	<hr/> 16

The totality of finds in the Tabuhan area is :

Type of implements	Total	Percentage of total
Choppers	23	11.4
Chopping-tools	16	7.9
Hand-adzes	1	0.5
Proto-Handaxes	8	4.0
Hand-axes	6	3.0
Flakes	148	73.2
	<hr/> 202	<hr/> 100.0

Conclusions

Post-war discoveries by the present writer and his team have thrown new light on the vertical distribution of the Pacitanian. Besides, new localities were revealed notably in the Tabuhan area, North of Punung.

In the region under consideration, the Gedeh River and the Sunglon River both break through the karstified hills on two places. The first tools have been found near the Gedeh River proper but it was not possible to locate any gravel terraces on its banks. Only on the right bank a low gravel bench was noticed with some palaeolithic tools. It was situated only one metre above the river-level. Apparently the terraces here are missing and have been removed by erosive action or they are superposed by a mantle of clay.

More succesful were the investigations in the Sunglon Valley where four defined implementiferous levels were exposed, respectively on one, six, eleven and twenty metres above streamlevel, while the small Serikan River furnished proof for the existence of at least two different implementiferous horizons ; one low bouldergravel at one metre and a gravel terrace at five metres above the river.

The tools of the low benches were found in the upper portion only and they are heavily rolled. Therefore, I presume that the tools are brought down by erosive wateraction from a higher level and that they are secondarily deposited. It is noteworthy that similar low benches accompany the Sunglon, Serikan, Gedeh and Baksoka rivers and its tributaries on both sides at an altitude of 1/2 - 2 metres above river-level. The terrace sequences of the Baksoka and Sunglon Valleys correspond very well and they have many features in common. They are characterized by four implementiferous terraces, showing a similar system of ancient streamlevels and four distinct cycles of erosion.

The most important terrace thusfar seems to be the 15-20 metres terrace from the Baksoka Valley. It is the highest and oldest in the sequences and is the most prominent in this region. As contrasted with the tools from the lower terraces and those of the riverbed, the implements are not waterworn and are made of silicified limestone. Apparently the tools have been fashioned during a period when the karst was nascent and before the river wore down its bed into the volcanic formation and the silicified tuff became available to the toolmakers. In this stage the Trinil Fauna occupied the region, their fossils have been found in fissures and sinkholes. Accordingly, the tools from this terrace may be of Middle-Pleistocene antiquity, but the Pacitanian persisted without any significant innovations into the first part of the Upper Pleistocene. These and other indications go to prove that the Pacitanian from the High Terrace and the lower terraces form a single culture. Therefore it seems clear that the Pacitanian shows an excessive slowness in the tempo of change in tool technique and in creating new forms.

The technique employed in working the Pacitanian tools is essentially monofacial, as has been already stated by Movius. The flake-tools which seldom exhibit either a bulb of percussion or a striking platform outnumber by far the pebble-tools. But the Pacitanian is characterized, too, by a great number of massive tools as choppers, chopping-tools, hand-adzes and proto-handaxes, the absence of true Levallois flakes and a low percentage of bifaces. The massive tools are made of rough lumps of silicified tuff and pebbles, the oldest from silicified limestone and a few of fossil wood. It is not uncommon to find that the butts are left untrimmed with a considerable part of the original crust of the pebble sticking to it.

As has been presumed by Movius, the Pacitanian demonstrates a fundamental similarity with, and is closely allied to the Anyathian of Upper Burma, both forming part of the great Chopper Chopping-tool complex of Southeastern Asia. Some conspicuous, not uncommon forms are 'Flat-iron' shaped choppers and the Tortoise or Turtle-back choppers. They are high-backed and 'flat-bottomed, plano-convex in section with "resolved" endlong flaking to the cutting-edges.

Contrary to the Anyathian, Choukoutienian, and Fingnoian, the Pacitanian comprises a low proportion of bifaces. Many of them are flatter and much less flaked on the lower than on the upper face. It is equally true that many of them show a technique of stone flaking, notably endlong trimming parallel to the axis of the object closely resembling the Chopper tradition. Nevertheless, it can not be ignored that we found some bifaces with regular outlines which were flaked in the best tradition of the Early Acheulean technique. There are ovates, round and almond forms and elongate thick-butted examples, some of them showing slightly 'S'-twisted cutting-edges. They could equally be classified as Early-Acheulean.

Movius suggests the idea that the Pacitan bifaces are locally developed, notably the pointed specimens evolved from the choppers and the ovates developed from the chopping-tools.

I am rather inclined to believe, in spite of the fact that thusfar no bifaces have been found in Upper Burma and Ceylon, that the hand-axes indicate the introduction of foreign forms, probably from Peninsular India. In this connection attention must be drawn to the fact that true bifaces were already well developed in the Early Pacitanian from the highest terrace in the sequences, which gives further support to my conception. The fact remains however, that only a small proportion of the tools may be labelled as classic Acheulean and that Levellois-tools are complete absent.

Our investigations concerning the Pacitan culture will be continued. More attention will be paid to the higher parts of the valleys where actual Lower Palaeolithic occupation sites are to be suspected.

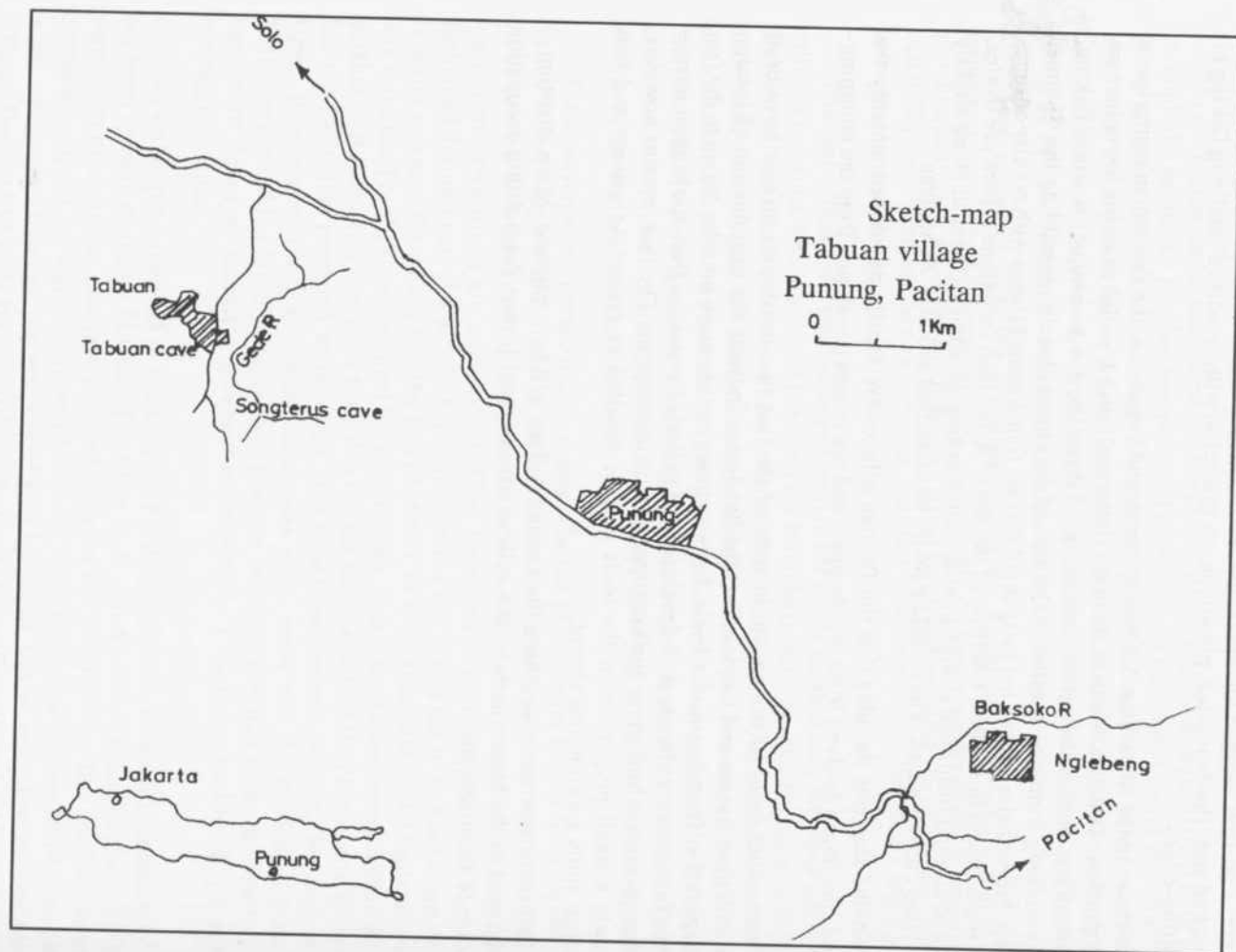


Fig. 1

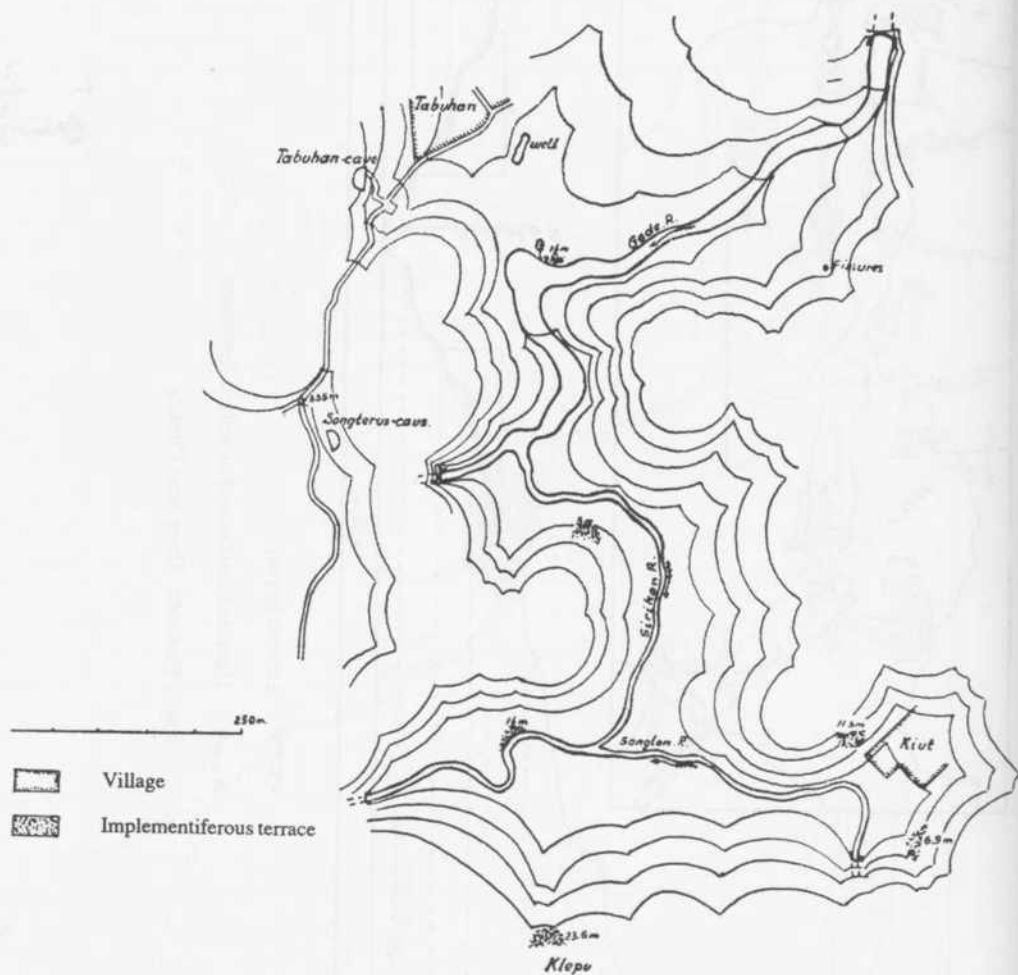
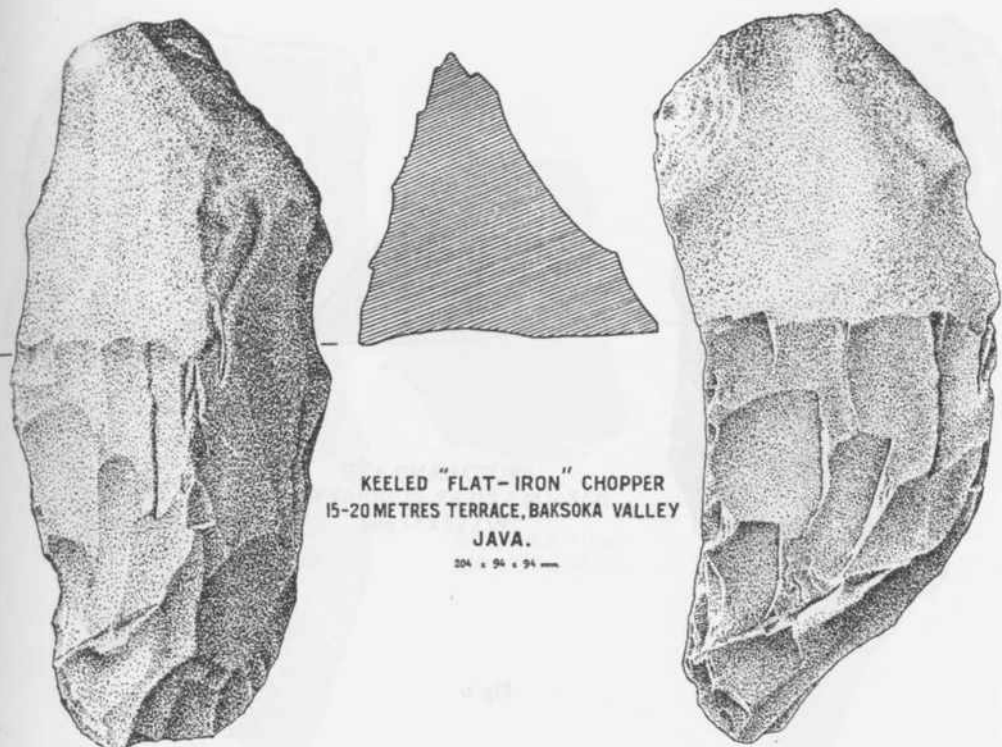
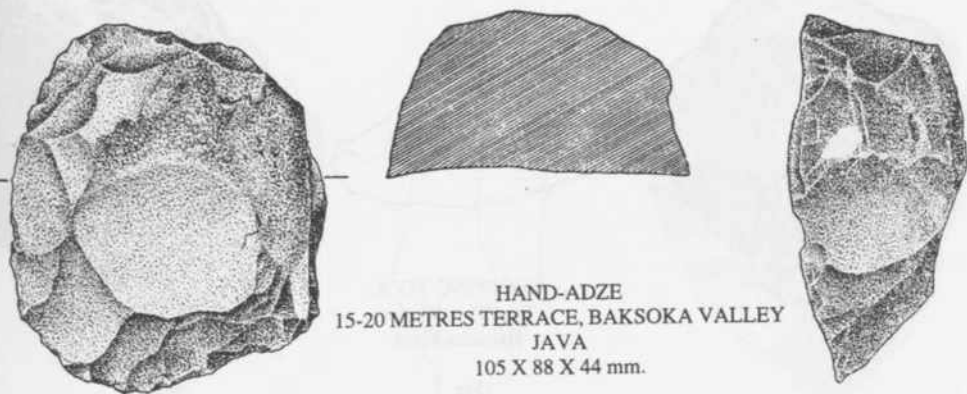


Fig. 3 Location of sites



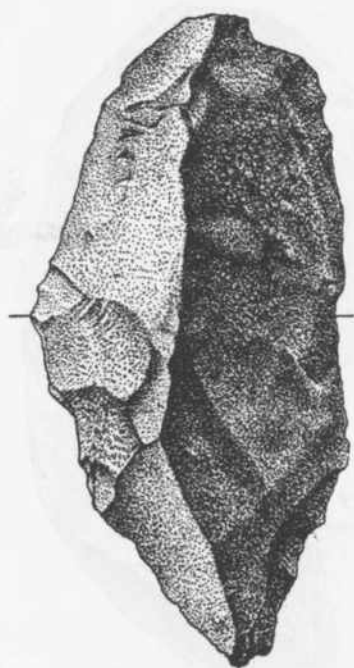
KEELED "FLAT-IRON" CHOPPER
15-20 METRES TERRACE, BAKSOKA VALLEY
JAVA.
204 x 94 x 94 mm.

Fig. 4



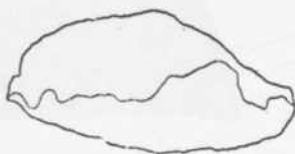
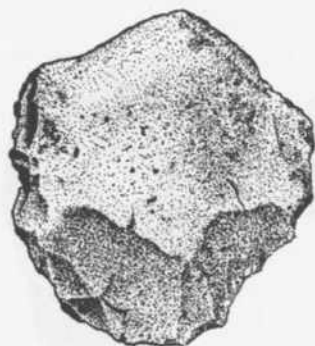
HAND-ADZE
15-20 METRES TERRACE, BAKSOKA VALLEY
JAVA
105 X 88 X 44 mm.

Fig. 5



PROTO HAND-AXE
BAKSOKA RIVER, PUNUNG, JAVA
190 x 92 x 57 mm.

Fig. 6



CHOPPING-TOOL
96 x 91 x 40 mm
Baksoka River

Fig. 7

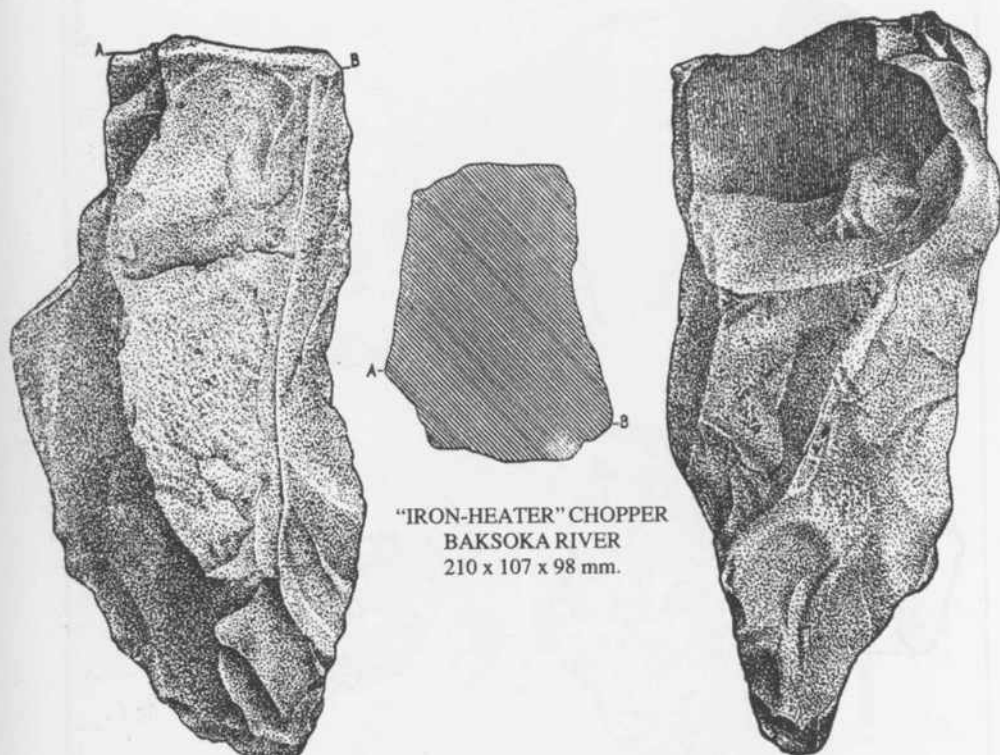


Fig. 8

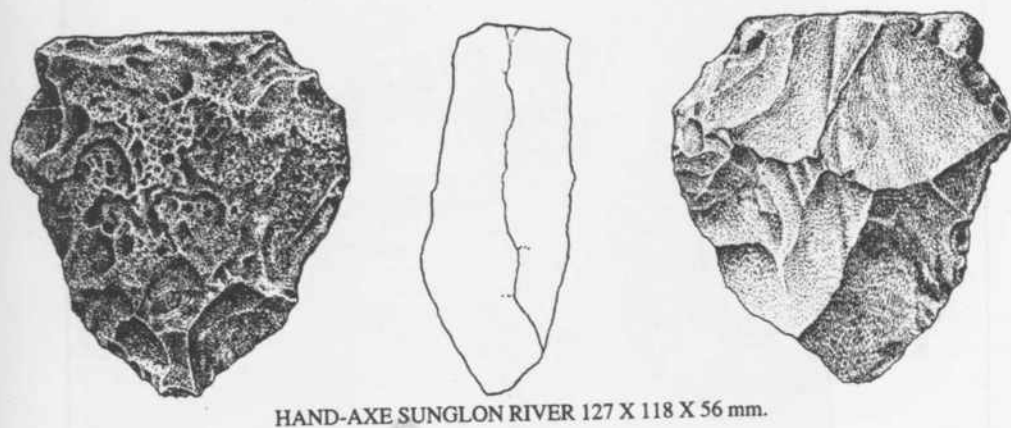
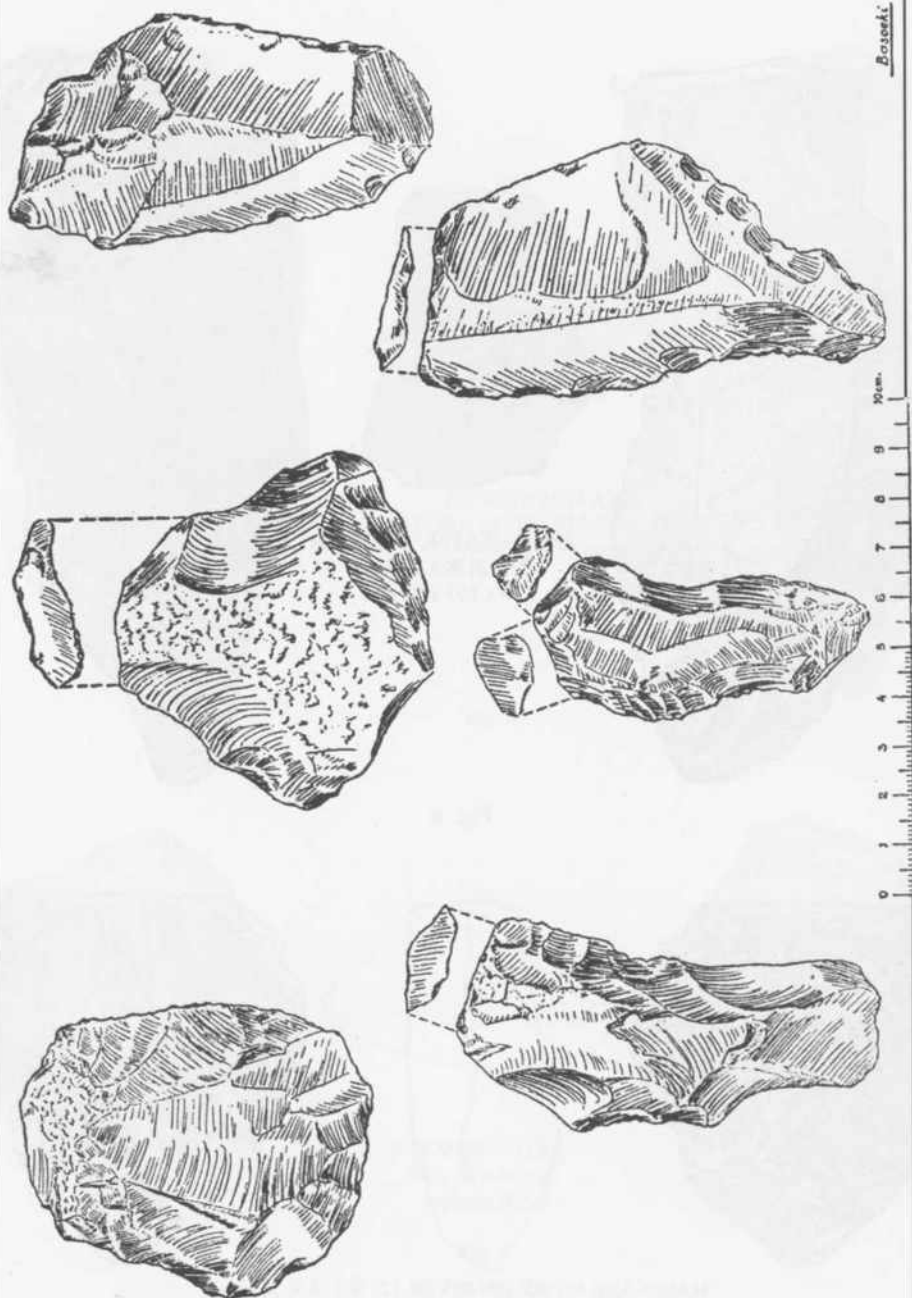
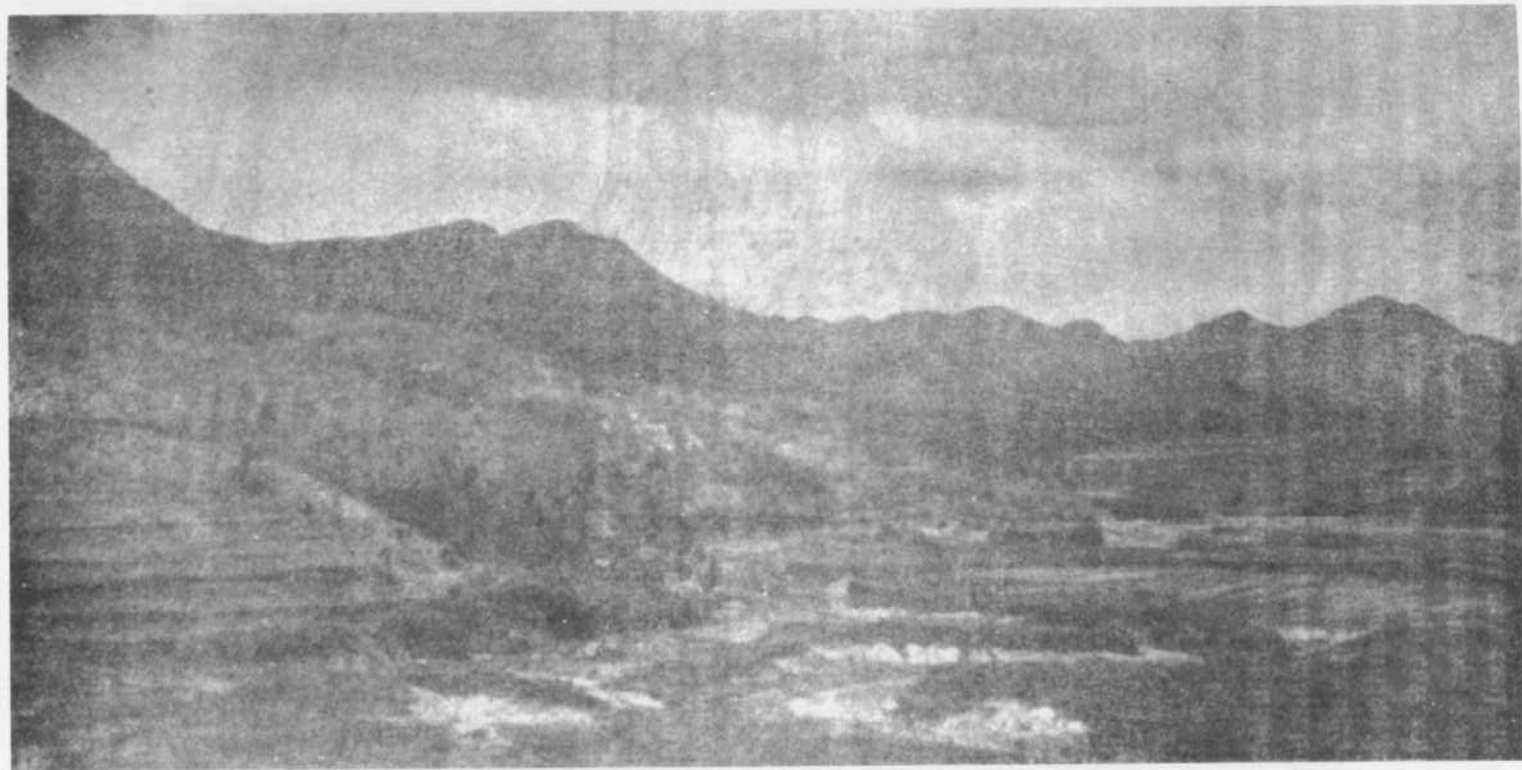


Fig. 9

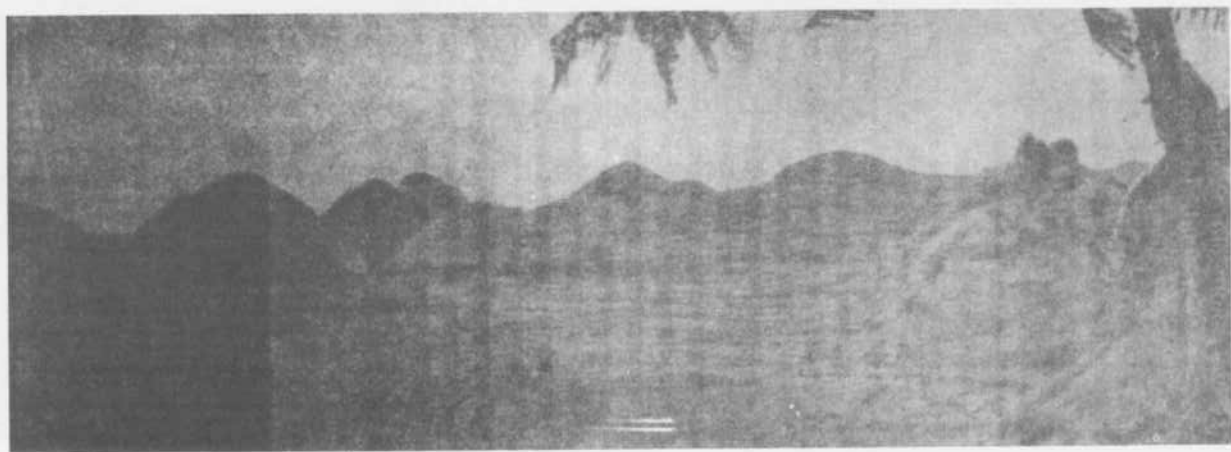




Pl. 1 Baksoka Valley



Pl. 2 Implementiferous bouldergravel 1 1/2 metres above the Baksoka river



Pl. 3 Karstified Hills near Tabuhan. 'Sewu' mountains.



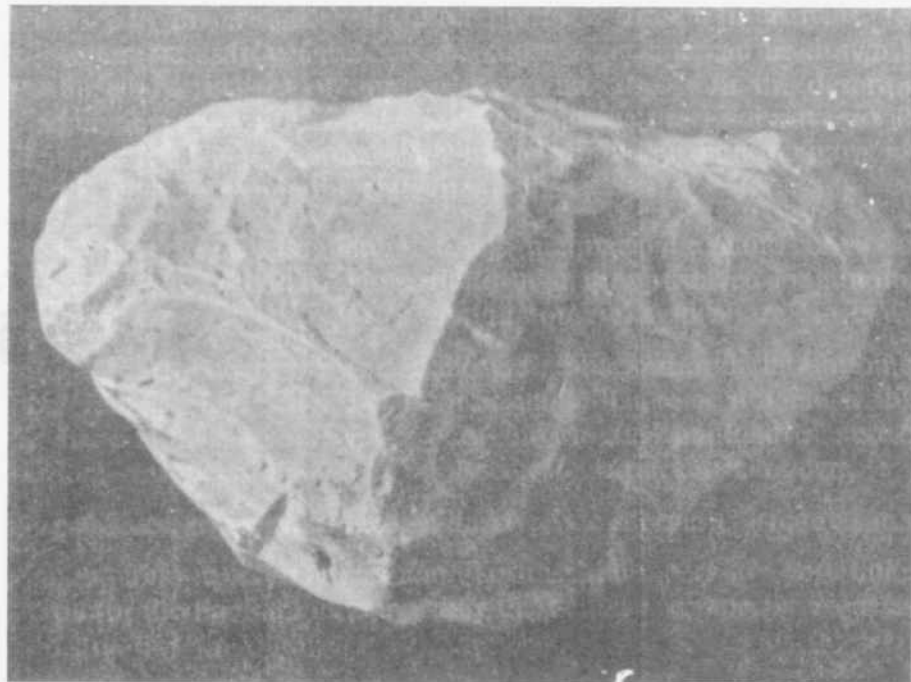
Pl. 4 Lake Gujang Warak near Punung



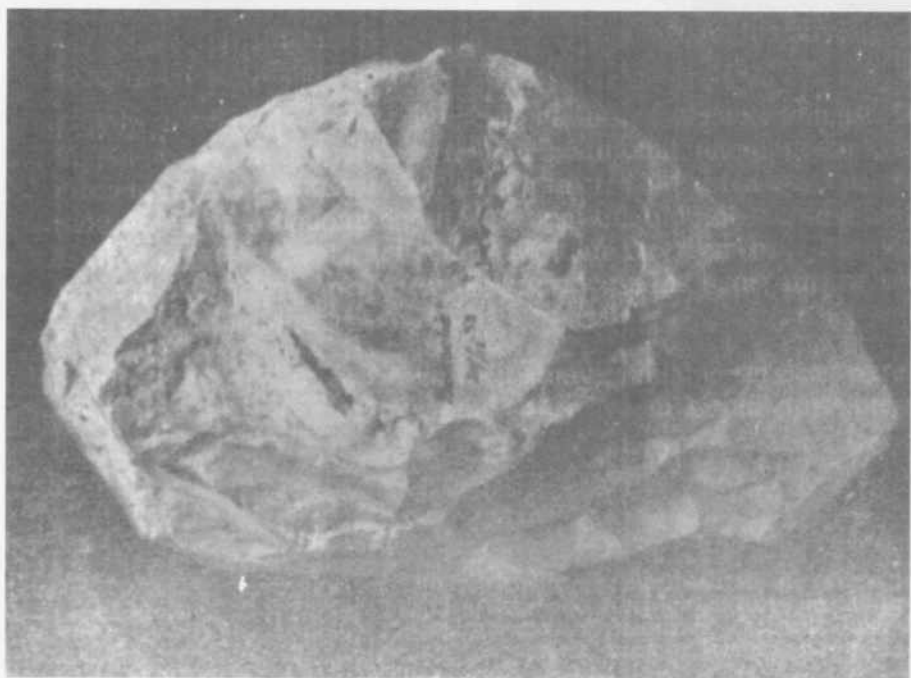
Pl. 5 Gedeh River



Pl. 6 Gedeh River

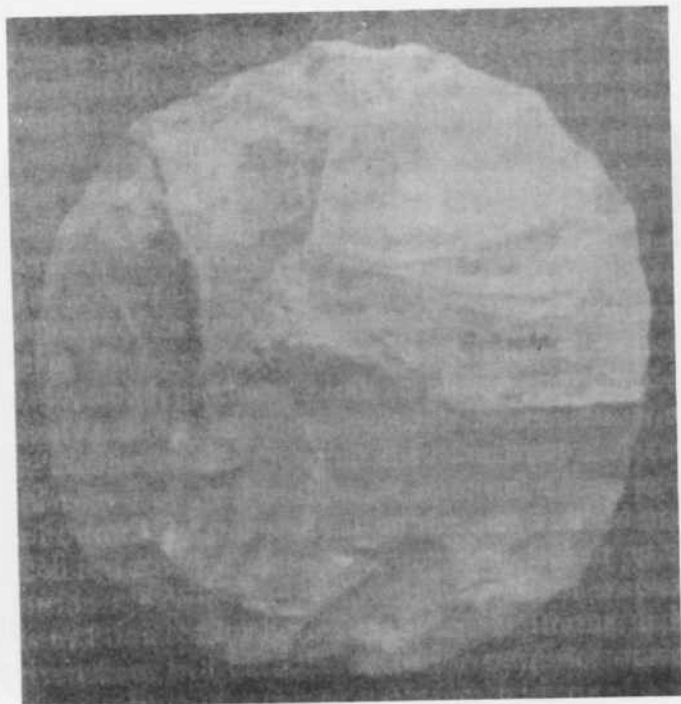


Pl. 7b



Pl. 7a

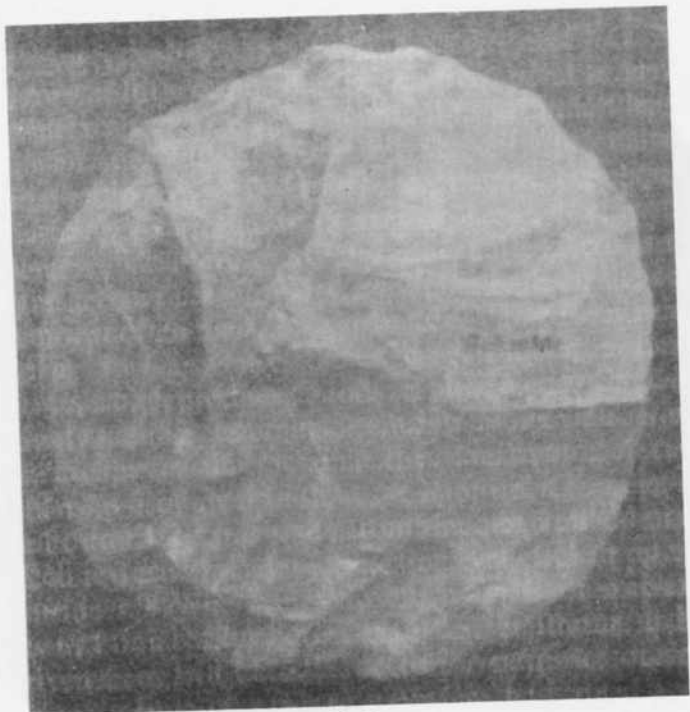
Long bivalacial hand-axe
Baksoka River



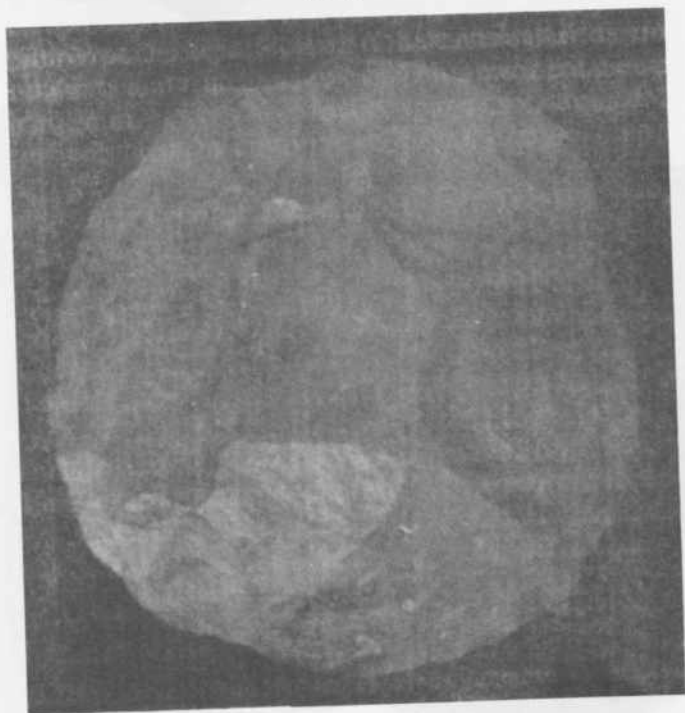
Pl. 8a



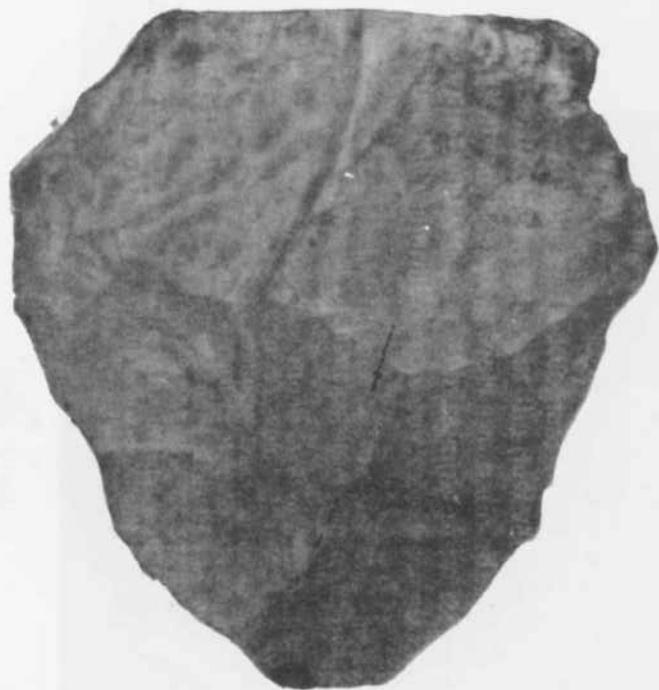
Pl. 8b
Disclike Biface
Baksoka River



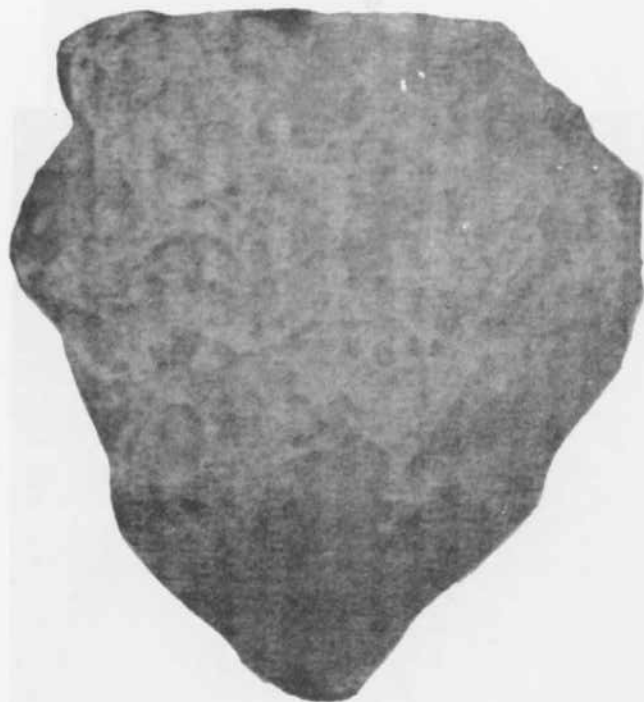
Pl. 8a



Pl. 8b
Disclike Biface
Baksoka River

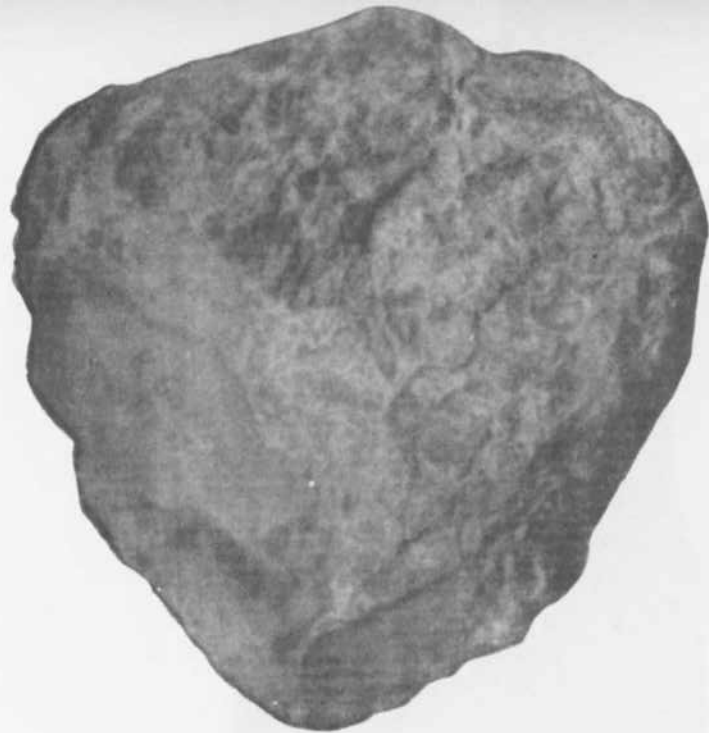


Pl. 9a

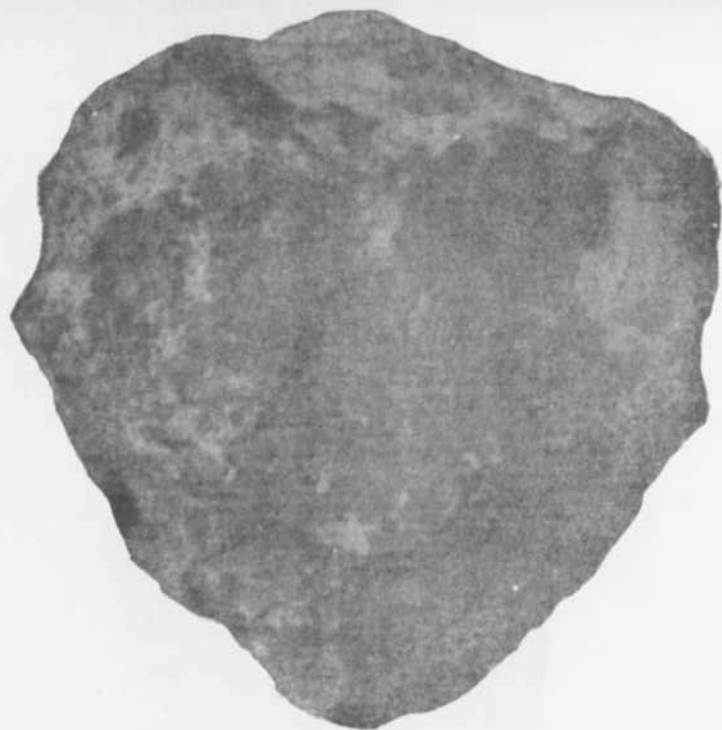


Pl. 9b

Hand-axe
Sunglon River



Pl. 10a



Pl. 10b

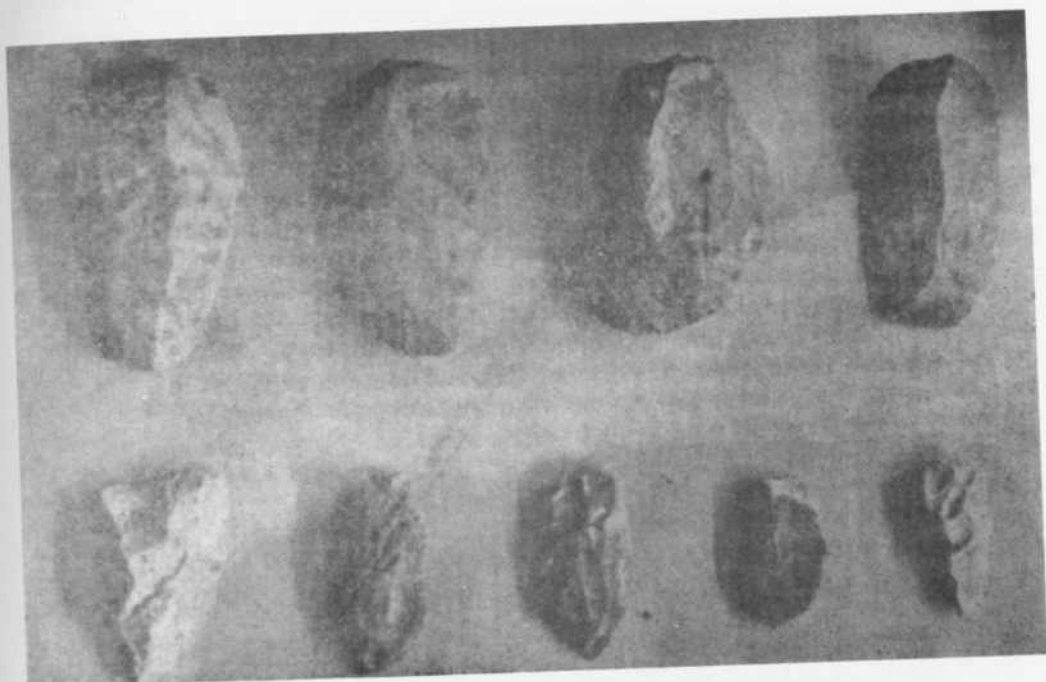
Chopping-tool
Gedeh River



Pl. 11 'Flat-iron' chopper
Baksoka River



Pl. 12 Proto Handaxe
Baksoka River



Pl. 13 Flake-tools. Baksoka River